



September 20, 2005

Mr. Ron Allen  
California Regional Water Quality Control Board  
North Coast Region  
5550 Skyline Boulevard, Suite A  
Santa Rosa, California 95403

10-291-13-004

Subject: Case No. 1TDN063  
Groundwater Monitoring and Sampling Report  
Colvin Oil Company Crescent City Texaco Station  
284 South "L" Street  
Crescent City, California

Dear Mr. Allen:

On behalf of Colvin Oil Company, Alisto Engineering Group is pleased to submit this report on the groundwater monitoring and sampling performed at Crescent City Texaco Station at 284 South "L" Street, Crescent City, California.

Please call if you have questions or comments.

Sincerely,

ALISTO ENGINEERING GROUP

A handwritten signature in black ink, appearing to read "Bo Bowman", with a long, sweeping horizontal line extending to the right.

Bo Bowman  
Project Manager

Enclosure

cc: Mr. Lane Colvin, Colvin Oil Company  
Mr. Leon Perreault, Del Norte County Health Department



September 20, 2005

Mr. Lane Colvin  
Colvin Oil Company  
2520 Foothill Boulevard  
Grants Pass, Oregon 97526

10-291-13-004

Subject: Groundwater Monitoring and Sampling Report  
Colvin Oil Company Crescent City Texaco Station  
284 South "L" Street  
Crescent City, California

Dear Mr. Colvin:

Alisto Engineering Group is pleased to submit this report on the groundwater monitoring and sampling performed at Colvin Oil Company's Crescent City Texaco Station at 284 South "L" Street, Crescent City, California.

With your authorization, Alisto have already submitted a copy of the report on your behalf to the appropriate regulatory agencies.

Please call if you have questions or comments.

Sincerely,

ALISTO ENGINEERING GROUP

A handwritten signature in black ink, appearing to read "Bo Bowman", with a long, sweeping horizontal line extending to the right.

Bo Bowman  
Project Manager

Enclosure

**GROUNDWATER MONITORING  
AND SAMPLING REPORT  
THIRD QUARTER 2005**

Colvin Oil Company  
Crescent City Texaco Station  
284 South "L" Street  
Crescent City, California

Alisto Project No. 10-291

September 20, 2005

**GROUNDWATER MONITORING AND SAMPLING REPORT  
THIRD QUARTER 2005**

**Colvin Oil Company  
Crescent City Texaco Station  
284 South "L" Street  
Crescent City, California**

**Project No. 10-291-13-004**

**Prepared for:**

**Colvin Oil Company  
2520 Foothill Boulevard  
Grants Pass, Oregon**

**Prepared by:**

**Alisto Engineering Group  
2737 North Main Street, Suite 100  
Walnut Creek, California**

**September 20, 2005**



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**Bo Bowman  
Project Manager**



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**Al Sevilla, P.E.  
Principal**



# **GROUNDWATER MONITORING AND SAMPLING REPORT THIRD QUARTER 2005**

**Colvin Oil Company  
Crescent City Texaco Station  
284 South "L" Street  
Crescent City, California**

**Project No. 10-291-13-004**

**September 20, 2005**

## **INTRODUCTION**

This report presents the results and findings of the August 31, 2005 groundwater monitoring and sampling performed by Alisto Engineering Group at Colvin Oil Company's Crescent City Texaco Station, 284 South "L" Street, Crescent City, California. The site vicinity map is shown on Figure 1.

## **FIELD PROCEDURES**

Field procedures used for groundwater monitoring and sampling were in accordance with the procedures and guidelines of the Del Norte County Health Department and the California Regional Water Quality Control Board, North Coast Region.

Before purging and sampling, the groundwater level in each well was measured from a permanent mark on top of the casing to the nearest 0.01 foot using an electronic water level indicator. The depth to groundwater and top of casing elevation data were used to calculate the groundwater elevation in each well in reference to mean sea level. The survey data and groundwater elevation measurements collected to date, including data from previous monitoring and sampling events, are presented in Table 1. The potentiometric groundwater surface elevation map is shown on Figure 2.

Before sample collection, each well was purged of at least 3 casing volumes while recording pH, conductivity, and temperature. Groundwater samples were collected for laboratory analysis by lowering a bottom-fill, disposable bailer or plastic tubing with a check valve to just below the water level in the well, and transferred from the bailer into laboratory-supplied containers. Field procedures for groundwater monitoring and sampling and field data sheets are presented in Appendix A.

## **ANALYTICAL METHODS**

Groundwater samples collected during this sampling event were analyzed by Argon Laboratories, Inc., a state-certified laboratory, using standard test methods of the U.S. EPA and the California Department of Health Services for the following:

- Total petroleum hydrocarbons as gasoline (TPH-G) using EPA Methods 8015.
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method Modified 8020.
- Methyl tert-butyl ether (MTBE) using EPA Method Modified 8020.
- Additionally, samples collected from Monitoring Wells MW-2 and MW-4 were analyzed for MTBE using EPA Method 8260B to confirm the results of EPA Method 8020 analysis.

The laboratory reports and chain of custody records are included in Appendix B and the analytical results are summarized in Table 1 and shown on Figure 3. Graphs of concentrations of MTBE detected in each groundwater monitoring well over time are shown on Figures 4.

## RESULTS AND FINDINGS

The results and findings of the August 2005 sampling event are summarized below.

- The depth to water in the wells ranged from 4.60 to 5.45 feet, corresponding to elevations ranging from 6.91 to 7.35 feet above mean sea level. Groundwater elevations over time are graphically depicted on Figure 5. The interpreted groundwater flow direction is to the southeast with a gradient of approximately 0.002, which is consistent with the results of previous monitoring events.
- BTEX were not detected above the reported detection limits in any of the groundwater samples collected from the monitoring wells.
- TPH-G was not detected above the reported detection limit in any well except in MW-2 at a concentration of 170 micrograms per liter (ug/l). Review of analytical results indicated that the TPH-G detected in the sample is primarily composed of MTBE.
- MTBE was detected in the samples from Wells MW-2 and MW-4 at concentrations of 590 and 100 ug/L using EPA Method 8260B.

## TABLE

TABLE 5 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING FROM MONITORING WELLS  
COLVIN OIL COMPANY - FIREBALL/TEXACO SERVICE STATION  
284 SOUTH "L" STREET, CRESCENT CITY, CALIFORNIA

ALISTO PROJECT NO. 10-291

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ug/l)	TPH-D (ug/l)	TPH-MO (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (EPA 8020) (ug/l)	MTBE (EPA 8260) (ug/l)	DIPE (ug/l)	ETBE (ug/l)	TAME (ug/l)	TBA (ug/l)	1,2-DCA (ug/l)	EDB (ug/l)	DO (ppm)	TOTAL LEAD (ug/l)	LAB
MW-1	08/17/95	12.70	4.04	8.66	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	08/18/95	---	---	---	ND<50	240	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	---	ND<5	NET
MW-1	02/04/97	12.70	4.1	8.6	ND<50	54	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	0.70	ND<5	AEN
MW-1	05/08/97	12.70	4.6	8.1	ND<50	150 (c)	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	---	8.7	SA
MW-1	08/12/97	12.70	5.33	7.37	ND<50	230 (c)	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	---	7.2	SA
MW-1	11/20/97	12.70	4.49	8.21	ND<50	250 (c)	---	ND<0.50	ND<0.50	ND<0.50	ND<0.50	---	---	---	---	---	---	---	---	---	3.7	SA
MW-1	02/11/98	12.70	4.49	8.21	ND<50	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	ND<5.0	ND<1.0	ND<1.0	ND<1.0	ND<5.0	---	---	---	ND<3	MAI
MW-1	05/22/98	12.70	4.71	7.99	ND<50	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	ND<5.0	---	---	---	---	---	---	0.18	ND<0.3	MAI
MW-1	12/15/99	12.70	4.47	8.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	12/16/99	---	---	---	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
MW-1	04/10/00	12.70	4.84	7.86	ND<50	---	---	ND<0.5	1.2	ND<0.5	ND<0.5	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	---	---	---	---	ARG
MW-1	08/05/00	12.70	5.98	6.72	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
MW-1	11/20/00	12.70	4.92	7.78	ND<50	ND<50	ND<500	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	---	---	---	---	---	---	---	1.7	---	ARG
MW-1	02/23/01	12.70	4.24	8.46	ND<50	ND<50	ND<500	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	---	---	---	---	---	---	---	0.9	---	ARG
MW-1	04/26/01	12.70	4.86	7.84	ND<50	ND<50	ND<500	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	---	---	---	---	---	---	---	0.9	---	ARG
MW-1	08/02/01	12.70	4.80	7.90	ND<50	ND<50	ND<500	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	---	---	---	---	---	---	---	0.7	---	ARG
MW-1	04/18/02	12.70	4.39	8.31	ND<50	ND<50	ND<500	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	1.09	---	ARG
MW-1	08/06/02	12.70	4.58	8.12	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	3.06	---	ARG
MW-1	12/27/02	12.70	3.65	9.05	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
MW-1	10/26/04	12.70	4.44	8.26	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
MW-1	01/26/05	12.70	4.72	7.98	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
QC-1	01/26/05	---	---	---	---	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
MW-1	06/09/05	12.70	4.87	7.83	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
MW-1	08/31/05	12.70	5.35	7.35	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
MW-2	08/17/95	12.20	3.9	8.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-2	08/18/95	---	---	---	ND<50	110	---	1.2	2.1	ND<0.5	2.1	---	---	---	---	---	---	---	---	---	6	NET
MW-2	02/04/97	12.20	4.19	8.01	ND<50	62	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	2.60	ND<5	AEN
MW-2	05/08/97	12.20	4.63	7.57	1100 (d)	170 (c)	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	---	120	SA
MW-2	08/12/97	12.20	5.24	6.96	1600	430 (c)	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	---	10	SA
MW-2	11/20/97	12.20	4.5	7.7	260 (e)	200 (c)	---	ND<0.50	ND<0.50	ND<0.50	0.81	---	---	---	---	---	---	---	---	---	5.8	SA
MW-2	02/11/98	12.20	4.5	7.7	66	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	730	1000	ND<1.0	40	61	370	---	---	---	ND<3.0	MAI
QC-1 (f)	02/11/98	---	---	---	90	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	700	---	---	---	---	---	---	---	---	---	MAI
MW-2	05/22/98	12.20	4.76	7.44	ND<50	ND<50	---	ND<0.5	0.74	ND<0.5	1.2	4700	---	---	---	---	---	---	---	0.20	ND<3.0	MAI
QC-1 (f)	05/22/98	---	---	---	---	---	---	ND<0.5	0.81	ND<0.5	0.73	4600	---	---	---	---	---	---	---	---	---	MAI
MW-2	12/15/99	12.20	4.42	7.78	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-2	12/16/99	---	---	---	ND<50	---	---	250	ND<2.5	ND<2.5	ND<2.5	10000	---	---	---	---	---	---	---	---	---	ARG
QC-1 (f)	12/16/99	---	---	---	ND<50	---	---	260	ND<2.5	ND<2.5	ND<2.5	12000	---	---	---	---	---	---	---	---	---	ARG
MW-2	04/10/00	12.20	4.77	7.43	ND<50	---	---	110	ND<0.5	ND<0.5	ND<0.5	13000	12000	ND<250	ND<250	290	ND<2500	---	---	---	---	ARG
QC-1 (f)	04/10/00	---	---	---	ND<50	---	---	120	ND<0.5	ND<0.5	ND<0.5	15000	12000	ND<250	ND<250	320	ND<2500	---	---	---	---	ARG
MW-2	08/05/00	12.20	5.96	6.24	ND<50	---	---	38	ND<0.5	ND<0.5	ND<0.5	4000	---	---	---	---	---	---	---	---	---	ARG
MW-2	11/20/00	12.20	4.99	7.21	290	ND<50	ND<500	35	ND<0.5	ND<0.5	ND<0.5	6700	---	---	---	---	---	---	---	1.4	---	ARG
QC-1 (f)	11/20/00	---	---	---	270	ND<50	ND<500	34	ND<0.5	ND<0.5	ND<0.5	6800	---	---	---	---	---	---	---	---	---	ARG
MW-2	02/23/01	12.20	4.24	7.96	ND<50	ND<50	ND<500	5.0	ND<0.5	ND<0.5	ND<0.5	800	760	ND<20	ND<20	ND<20	ND<200	ND<20	ND<20	1.2	---	ARG
MW-2	04/26/01	12.20	4.96	7.24	ND<50	ND<50	ND<500	2.2	ND<0.5	ND<0.5	ND<0.5	410	390	ND<2.0	ND<2.0	ND<2.0	ND<20	ND<2.0	ND<2.0	0.9	---	ARG
QC-1 (f)	04/26/01	---	---	---	ND<50	---	---	2.0	ND<0.5	ND<0.5	ND<0.5	430	---	---	---	---	---	---	---	---	---	ARG
MW-2	08/02/01	12.20	4.91	7.29	ND<50	ND<50	ND<500	ND<0.5	ND<0.5	ND<0.5	ND<0.5	360	---	---	---	---	---	---	---	0.9	---	ARG
MW-2	04/18/02	12.20	4.48	7.72	ND<50	ND<50	ND<500	3.1	ND<0.5	ND<0.5	ND<1.0	330	340	ND<2.0	9.1	9.5	120	ND<2.0	ND<2.0	6.1	---	ARG
QC-1 (f)	04/18/02	---	---	---	ND<50	---	---	2.9	ND<0.5	ND<0.5	ND<1.0	330	---	---	---	---	---	---	---	---	---	ARG
MW-2	08/06/02	12.20	5.00	7.20	ND<50	---	---	11	ND<0.5	ND<0.5	ND<1.0	220	300	ND<2.0	49	52	64	ND<2.0	ND<2.0	1.87	---	ARG
QC-1 (f)	08/06/02	---	---	---	ND<50	---	---	11	ND<0.5	ND<0.5	ND<1.0	210	---	---	---	---	---	---	---	---	---	ARG
MW-2	12/27/02	12.20	3.77	8.43	ND<50	---	---	4.1	ND<0.5	ND<0.5	ND<1.0	850	780	---	---	---	---	---	---	---	---	ARG
QC-1 (f)	12/27/02	---	---	---	ND<50	---	---	5.7	ND<0.5	ND<0.5	ND<1.0	680	---	---	---	---	---	---	---	---	---	ARG
MW-2	10/26/04	12.20	4.41	7.79	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	2300	3100	---	---	---	---	---	---	---	---	ARG
MW-2	01/26/05	12.20	4.75	7.45	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	340	350	---	---	---	---	---	---	---	---	ARG
MW-2	06/09/05	12.20	4.89	7.31	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	690	770	---	---	---	---	---	---	---	---	ARG
MW-2	08/31/05	12.20	5.24	6.96	170	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	550	590	---	---	---	---	---	---	---	---	ARG
MW-3	08/17/95	12.46	4.14	8.32	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



TABLE 5 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING FROM MONITORING WELLS  
COLVIN OIL COMPANY - FIREBALL/TEXACO SERVICE STATION  
284 SOUTH "L" STREET, CRESCENT CITY, CALIFORNIA

ALISTO PROJECT NO. 10-291

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ug/l)	TPH-D (ug/l)	TPH-MO (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (EPA 8020) (ug/l)	MTBE (EPA 8260) (ug/l)	DIPE (ug/l)	ETBE (ug/l)	TAME (ug/l)	TBA (ug/l)	1,2-DCA (ug/l)	EDB (ug/l)	DO (ppm)	TOTAL LEAD (ug/l)	LAB
MW-3	08/18/95	---	---	---	ND<50	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	---	ND<5	NET
MW-3	02/04/97	12.46	4.37	8.09	ND<50	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	0.60	ND<5	AEN
MW-3	05/08/97	12.46	4.84	7.62	ND<50	60 (g)	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	---	9.7	SA
MW-3	08/12/97	12.46	5.45	7.01	ND<50	ND<100	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	---	3.7	SA
MW-3	11/20/97	12.46	4.71	7.75	ND<50	120 (c)	---	ND<0.50	ND<0.50	ND<0.50	ND<0.50	---	---	---	---	---	---	---	---	---	19	SA
MW-3	02/11/98	12.46	4.71	7.75	ND<50	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	ND<5.0	ND<1.0	ND<1.0	ND<1.0	ND<5.0	---	---	---	ND<3.0	MAI
MW-3	05/22/98	12.46	5.00	7.46	ND<50	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	---	---	---	---	---	---	---	0.19	ND<3.0	MAI
MW-3	12/15/99	12.46	4.67	7.79	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	12/16/99	---	---	---	ND<50	---	---	0.7	ND<0.5	ND<0.5	ND<0.5	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
MW-3	04/10/00	12.46	5.00	7.46	ND<50	---	---	1.0	1.1	ND<0.5	ND<0.5	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	---	---	---	---	ARG
MW-3	08/06/00	12.46	6.44	6.02	ND<50	---	---	12	ND<0.5	ND<0.5	ND<0.5	24	---	---	---	---	---	---	---	---	---	ARG
MW-3	11/20/00	12.46	5.23	7.23	ND<50	ND<50	ND<500	1.0	ND<0.5	ND<0.5	ND<0.5	7.9	---	---	---	---	---	---	---	0.9	---	ARG
MW-3	02/23/01	12.46	5.23	7.23	ND<50	ND<50	ND<500	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	---	---	---	---	---	---	---	1.2	---	ARG
QC-1 (f)	02/23/01	---	---	---	ND<50	ND<50	ND<500	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
MW-3	04/26/01	12.46	5.22	7.24	ND<50	ND<50	ND<500	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	---	---	---	---	---	---	---	1.2	---	ARG
MW-3	08/02/01	12.46	5.17	7.29	ND<50	ND<50	ND<500	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	---	---	---	---	---	---	---	1.0	---	ARG
QC-1 (f)	08/02/01	---	---	---	ND<50	ND<50	ND<500	ND<0.5	0.7	ND<0.5	ND<0.5	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
MW-3	04/18/02	12.46	4.72	7.74	ND<50	ND<50	ND<500	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	1.02	---	ARG
MW-3	08/06/02	12.46	5.24	7.22	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	1.42	---	ARG
MW-3	12/27/02	12.46	3.77	8.69	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	1.42	---	ARG
MW-3	10/26/04	12.46	4.57	7.89	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
QC-1 (f)	10/26/04	---	---	7.46	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
MW-3	01/26/05	12.46	5	7.46	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
QC-1 (f)	06/09/05	---	---	7.34	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
MW-3	06/09/05	12.46	5.12	7.34	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
MW-3	08/31/05	12.46	5.45	7.01	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<5.0	---	---	---	---	---	---	---	---	---	ARG
MW-4	10/26/04	11.51	---	---	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	37	53	ND<0.5	ND<0.5	3	ND<5.0	ND<0.5	ND<0.5	---	---	ARG
MW-4	01/26/05	11.51	4.17	7.34	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	37	37	ND<0.5	ND<0.5	3	ND<5.0	ND<0.5	ND<0.5	---	---	ARG
MW-4	06/09/05	11.51	4.32	7.19	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	46	45	ND<0.5	ND<0.5	3	ND<5.0	ND<0.5	ND<0.5	---	---	ARG
MW-4	08/31/05	11.51	4.6	6.91	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	81	100	ND<0.5	ND<0.5	3	ND<5.0	ND<0.5	ND<0.5	---	---	ARG
B-1	08/15/95	---	---	---	98000	9900	---	3900	19000	2500	14000	---	---	---	---	---	---	---	---	---	63	NET
TB-1 (h)	08/15/95	---	---	---	---	---	---	ND<0.5	3.1 (i)	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	---	---	NET
TB-1 (h)	05/08/97	---	---	---	---	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	---	---	SA
TB-1 (h)	08/12/97	---	---	---	---	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	---	---	SA
TB-1 (h)	11/20/97	---	---	---	---	---	---	ND<0.50	ND<0.50	ND<0.50	ND<0.50	---	---	---	---	---	---	---	---	---	---	SA
QC-2 (h)	02/11/98	---	---	---	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	---	---	---	---	---	---	---	---	---	MAI
BB-1 (e)	08/18/95	---	---	---	---	---	---	ND<0.5	3.2 (i)	ND<0.5	ND<0.5	---	---	---	---	---	---	---	---	---	---	NET

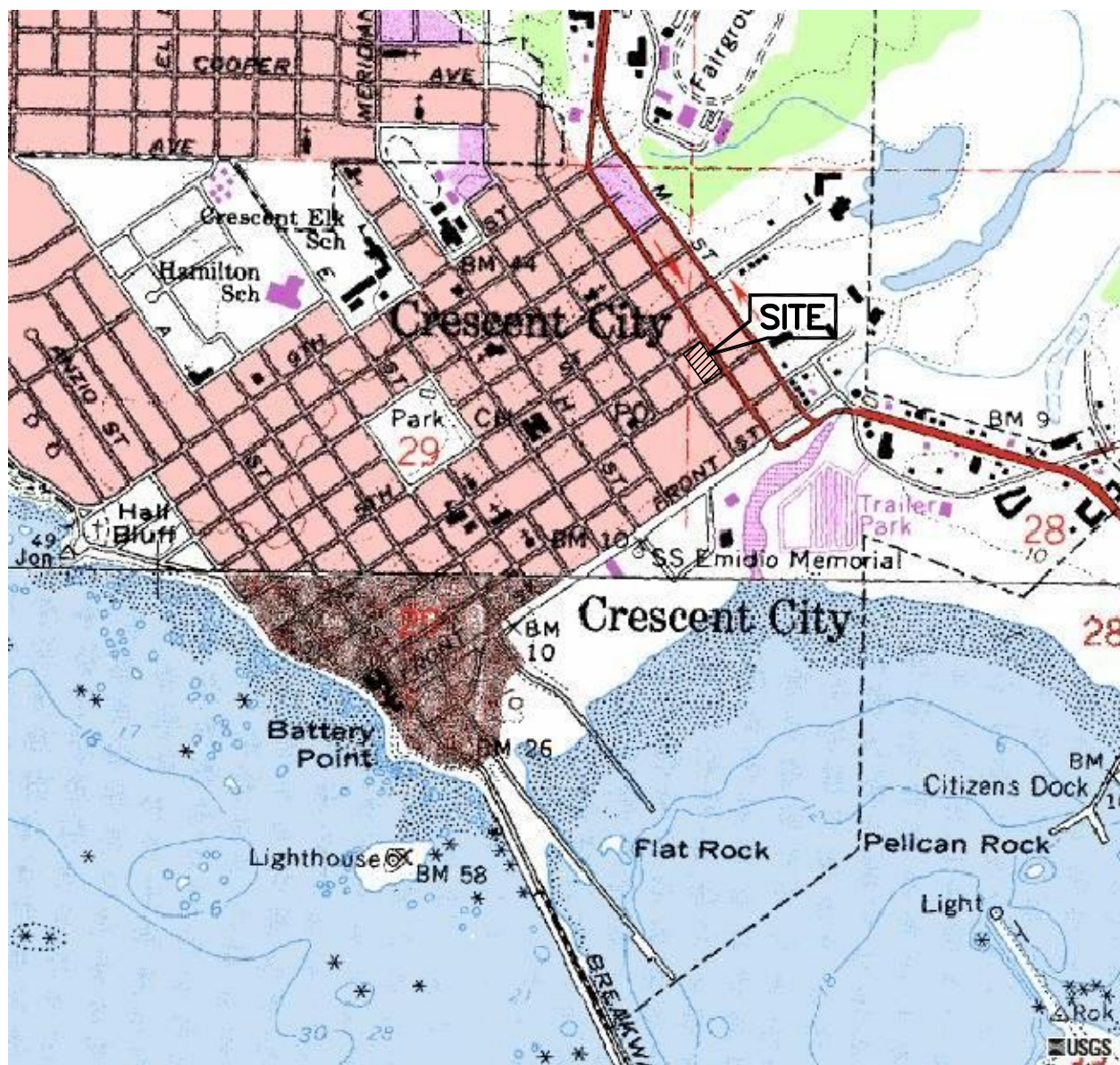
ABBREVIATIONS:

TPH-G Total petroleum hydrocarbons as gasoline  
TPH-D Total petroleum hydrocarbons as diesel  
TPH-MO Total petroleum hydrocarbons as motor oil  
B Benzene  
T Toluene  
E Ethylbenzene  
X Total xylenes  
DIPE Di-isopropyl ether  
ETBE Ethyl tert-butyl ether  
MTBE Methyl tert-butyl ether  
TAME Tert-amyl methyl ether  
TBA Tert-butanol  
1,2-DCA 1,2-Dichloroethane  
EDB 1,2-Dibromoethane  
DO Dissolved oxygen  
ug/l Micrograms per liter  
ppm Parts per million  
--- Not measured/analyzed/applicable  
ND Not detected above reported detection limit  
NET National Environmental Testing, Inc.  
AEN American Environmental Network, Inc.  
MAI McCampbell Analytical, Inc.  
ARG Argon Laboratories, Inc.

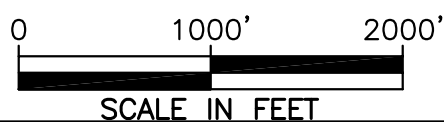
NOTES:

- (a) Top of casing elevations surveyed to the nearest 0.01 foot relative to mean sea level.  
(b) Groundwater elevations in feet above mean sea level.  
(c) This sample does not have a typical diesel pattern.  
(d) The result for gasoline is an unknown hydrocarbon which consists of several peaks.  
(e) The result appears to be a heavier hydrocarbon than diesel.  
(f) Blind duplicate.  
(g) ND for hydrocarbons, non-discrete baseline rise detected.  
(h) Trip blank.  
(i) Toluene concentrations appear to be associated with purchased deionized water.  
(j) Bailer blank.

## FIGURES



SOURCE:  
USGS MAPS, CRESCENT CITY QUADRANGLES,  
7.5 MINUTE SERIES. 1965  
PHOTOREVISED 1978.



## FIGURE 1

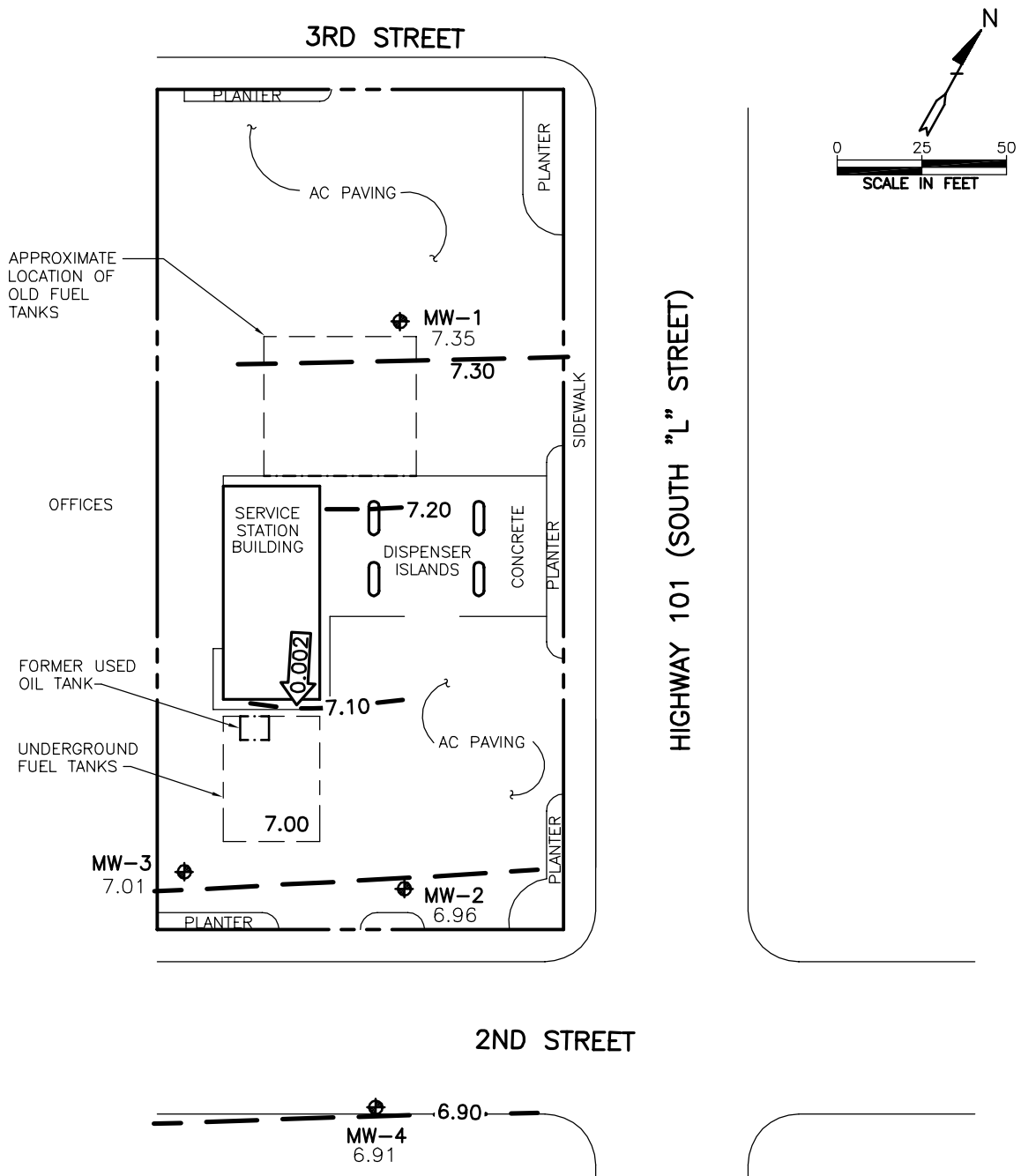
### SITE VICINITY MAP

FIREBALL SERVICE STATION  
284 SOUTH "L" STREET  
CRESCENT CITY, CALIFORNIA

PROJECT NO. 10-291



ALISTO ENGINEERING GROUP  
REDMOND, WASHINGTON



## LEGEND

⊕ GROUNDWATER MONITORING WELL

7.01 GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL

7.00 GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL - 0.10 FOOT)

←0.002 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

## FIGURE 2

### POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP

AUGUST 31, 2005

COLVIN OIL COMPANY  
FIREBALL SERVICE STATION  
284 SOUTH "L" STREET  
CRESCENT CITY, CALIFORNIA

PROJECT NO. 10-291



ALISTO ENGINEERING GROUP  
REDMOND, WASHINGTON

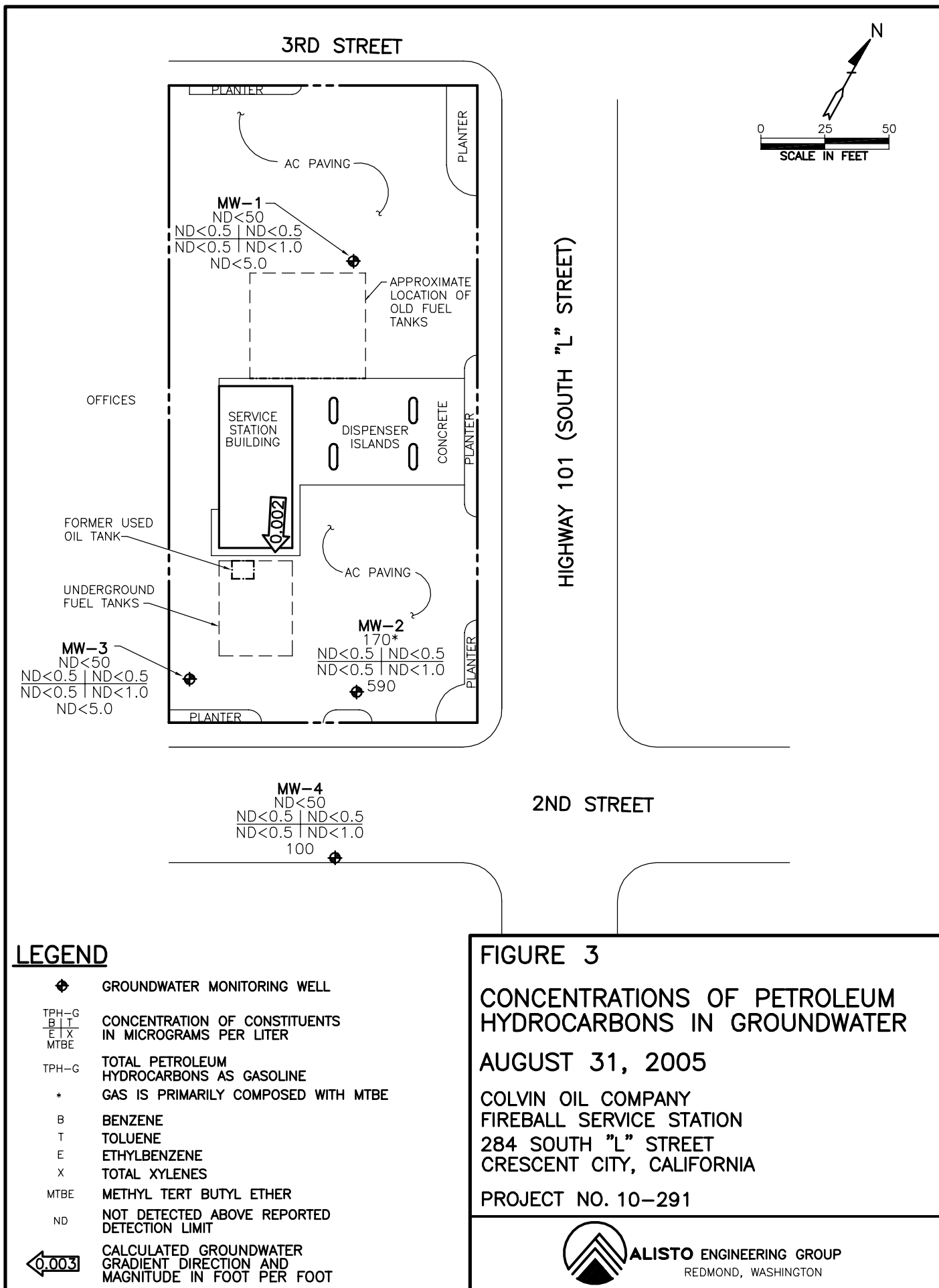


FIGURE 4: MTBE CONCENTRATIONS vs. TIME  
COLVIN OIL COMPANY, FIREBALL SERVICE STATION  
284 SOUTH "L" STREET, CRESCENT CITY, CALIFORNIA

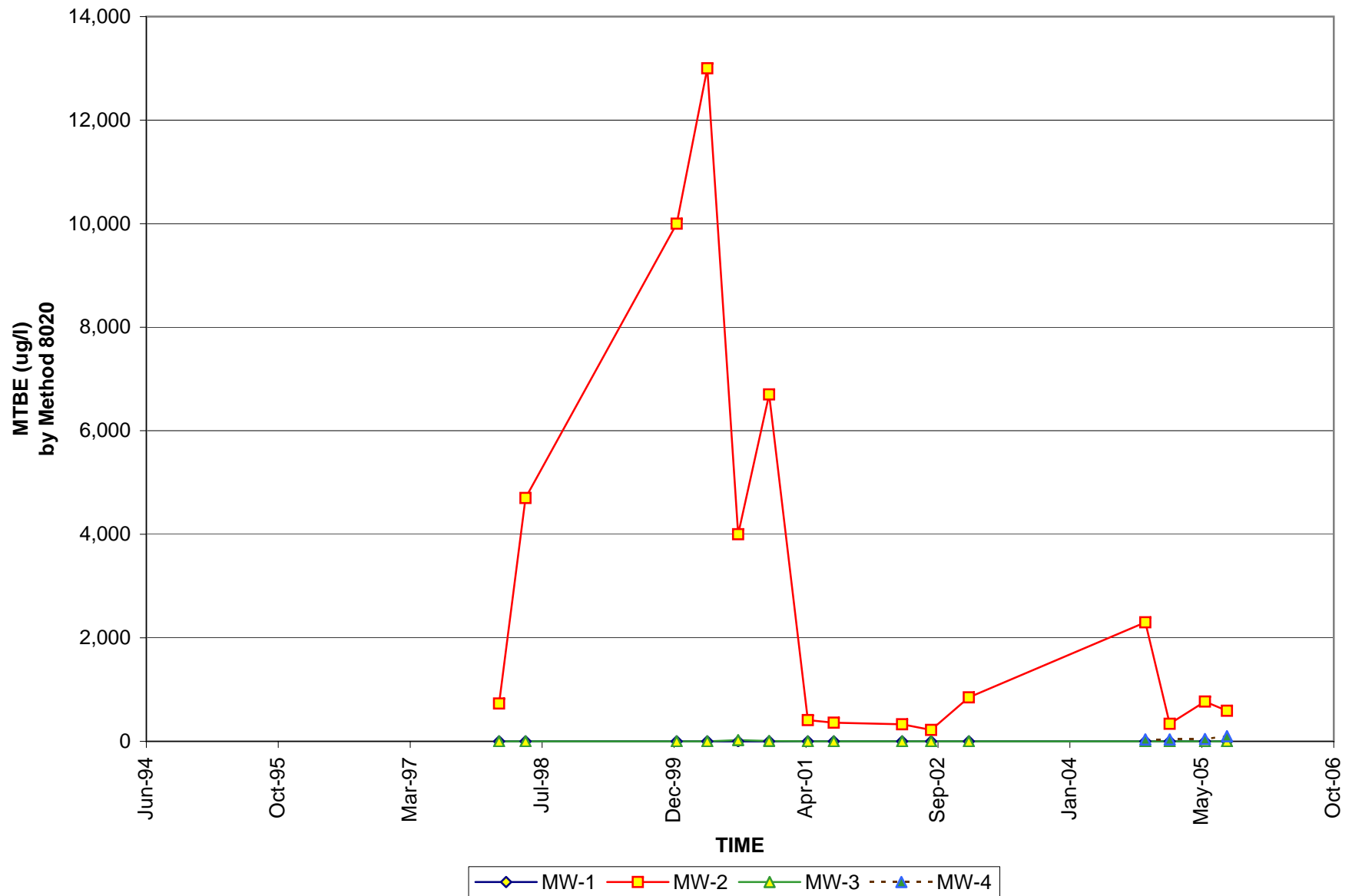
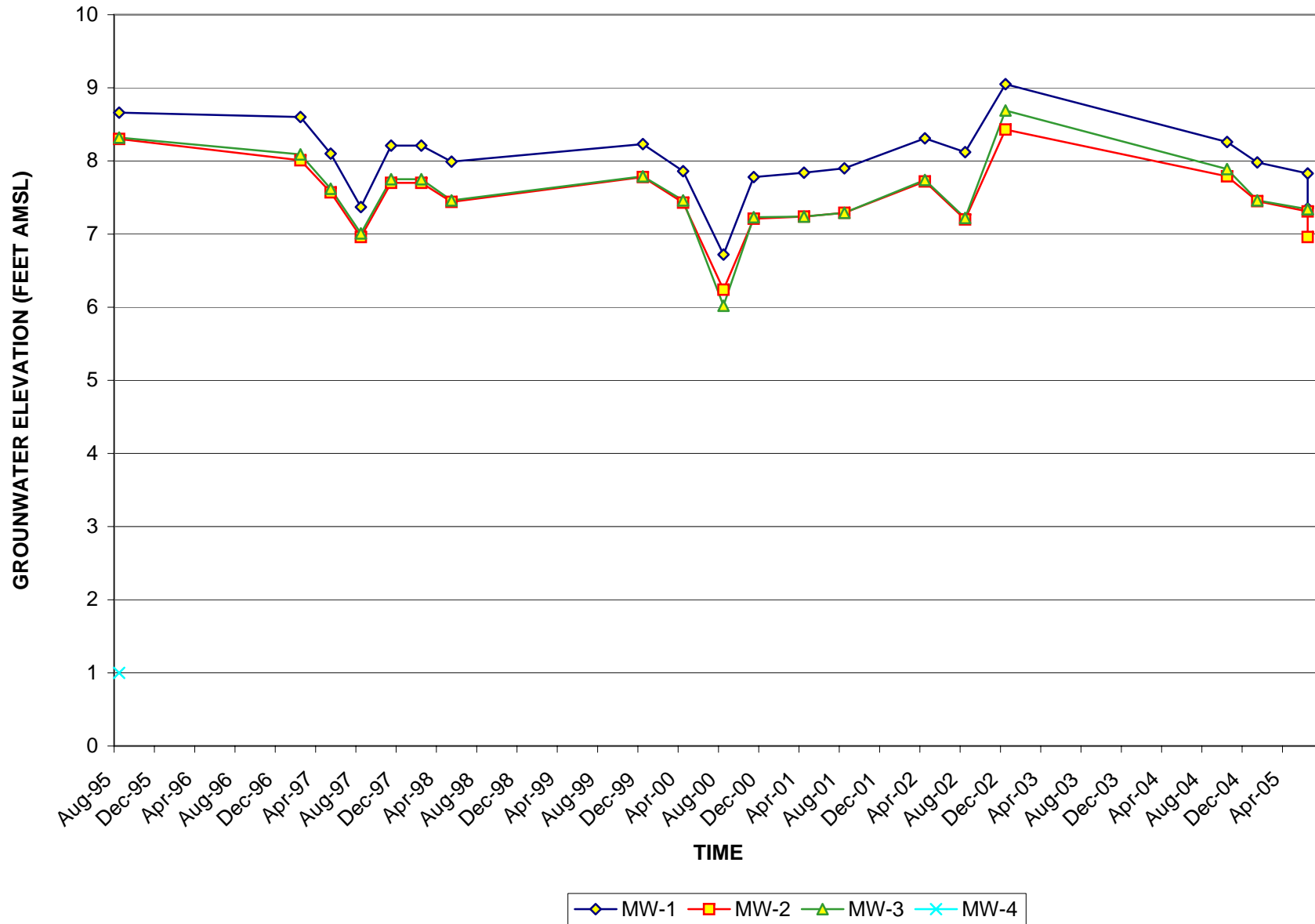


FIGURE 5: GROUNDWATER ELEVATIONS vs. TIME  
COLVIN OIL, FIREBALL SERVICE STATION  
284 SOUTH "L" STREET, CRESCENT CITY, CALIFORNIA



## **APPENDIX A**

### **FIELD PROCEDURES FOR GROUNDWATER MONITORING AND SAMPLING AND FIELD DATA SHEETS**



## **FIELD PROCEDURES FOR GROUNDWATER MONITORING AND SAMPLING**

### Groundwater Level Measurement

Before groundwater sampling, the groundwater level in each well was measured from the permanent survey reference point at the top of the well casing. Groundwater in each well was monitored for free-floating product or sheen. The depth to groundwater was measured to an accuracy of 0.01 foot from the top of the polyvinyl chloride well casing using an electronic water level indicator or interface probe.

### Groundwater Monitoring Well Sampling

The wells were purged of at least 3 casing volumes and the indicator parameters stabilized before sample collection. If a well was pumped dry before three casing volumes could be purged, then samples were collected after a sufficient volume of groundwater had recharged into the well. Purging was accomplished using a check valve and plastic tubing or bailer.

The groundwater samples were collected using a disposable bailer or plastic tubing, and then transferred into laboratory-supplied containers. The sampling technician wore nitrile gloves during purging and well sampling. The samples were labeled with well number, site identification, date and time of collection and sampler's initials, and transported in an iced cooler to the laboratory following preservation and chain of custody protocol.

## ALISTO ENGINEERING GROUP

## Site Visit Report

Alisto Project Number: 10-291-13-004	Site Address: 284 L St., Crescent City	SS#:	Purpose of Visit: <input type="checkbox"/> O&M <input type="checkbox"/> Vapor Sys. Sampling <input type="checkbox"/> GW Sys. Sampling <input type="checkbox"/> Other:	<input checked="" type="checkbox"/> GW Sampling + Monitoring <input type="checkbox"/> Prefield Activities <input type="checkbox"/> Emer/Alert Response
Arrival Date/Time: 8/31/05 / 1400	Alisto Personnel: LCB			
Departure Date/Time: 8/31/05 / 1700	Other Personnel:			

date	time	field activity
8-29	1400-1430	Met. see Redwood
8-30	0830-1230	Travel see Redwood
8-31	1400-1700	Monitor + Sample wells, Clean up wells (inside monument), replace locks + caps, clamp, paperwork
9-1	1300-1730	Travel (1/2 hr lunch)
9-2	1130-1200	Prep for Sample shipping, paperwork

Equipment	Equipment	Materials & Supplies	Materials & Supplies	Materials & Supplies
day (101) tank truck	day (585) PID Mini RAE	4 each (501) bailer, dispos.	each (578) 1/4" auto vent	1 each (614) decon kit
hr (104) truck	day (592) jack hammer	each (502) tyvek coverall	each (579) 1/3 hp sump pump	ft. (615) tfln tube 1/4"
85.5 mile (107) mileage	day (593) traffic control	each (505) bag filter	each (580) 1/2 hp sump pump	each (706) 1.5" X 6" Stainless steel Soil sampler liner
day (600) tank trailer	day (594) triplecheck	each (506) 1/4" B. valve	each (701) Hon'well paper	each (707) 2" X 6" Stainless steel Soil sampler liner
day (601) vacuum pump	day (595) vac test unit	each (507) soil tube cap	each (702) Hon'well chart pen	each (710) compressed air can
wk (610) thermal oxid.	day (599) dig. Camera	2 each (509) locks, keyed	each (704) boom socks	each (712) 1/4" Poly Tubing
day (529) soil samp. Kit	day (604) Gastech GT	each (510) locks, comb.	each (705) Air compressor	each (713) 1/2" Poly Tubing
day (530) 2 stage pump	day (605) vac test equip	each (515) filter, 20"	poly V belt	
day (533) PVC bailer	day (611) 12V pump	each (516) flow meter	1 each (708) 5 Gal. Bucket	
day (534) diaph. pump	day (612) air sparge tst.	each (517) press gauge	each (569) vac. relief valve	
day (535) generator	day (618) 5 ft ladder	each (518) flow met parts		
day (536) OVM	day (617) Thermo	each (519) coales. filters		
1 day (540) HORIBA U-10	Anemometer	each (521) filter, 9 7/8"	5 gloves:	fuses:
day (541) trash pump	day (621) Reciprocating Saw	each (525) Teflon liner	pr (608) nitrile, dispos	each (573) 175A Edison
day (548) hannah EH		each (526) sorbent pads	pr (504) vinyl, dispos	each (532) 200A Class J
1 day (550) water level m.		3M blankets	each (511) nitrile, heavy	each (531) 200A RK5
day (551) Hydak parameter		ft (503) 1/2" pvc hose	pr (703) driller gloves	each (561) fuse 3-9A
0.5 d (552) sensidyne pump		ft (542) 3/4" pvc hose		each (562) fuse 45-60A
day (553) dig. Thermometer		ft (544) 1/4" pvc hose	PVC well screen	each (537) fuse 70A lifflnr
day (554) dig. Multimeter		ft (615) 1/4" Teflon tube	each (522) 2" x 10'	each (546) fuse 80A lifflnr
day (555) DO meter/test		ft ( ) 3/8" Teflon tube	each (524) 2" x 5'	each (563) fuse 80A RK5TD
day (556) 1/16 HP AC		ft ( ) 1/2" Teflon tube	each (523) 4" x 5'	
day (557) 5.5 HP AC		each (571) 55-gal drum	each (583) splice kit	well vaults:
0.5 d (559) 1/2 HP AC		each (574) M-Tek chart paper	each (602) repair kit	each (572) 6.25" X 2.875"
day (558) color. test kit			each ( ) Sol Valve	each (590) 6.25" x 8.375"
day (560) volt meter		each (575) M-Tek pen	CGS-4232-nr1-228l-A120	each (580) 6.25" x 5.875"
day (566) gas smpl pmp		each (576) photo film	each (591) 1/4" sol valve	1 each (512) 2" locking well plug
day (567) PID		each (577) battery, "D"	B511ACH53A	each (513) 4" locking well plug
day (568) elec. pump			each (603) orc 2" Filter socks	each (514) 6" locking well plug
			each (609) TEDLAR BAG	each (582) well seal

truck mileage: 395.5	from 82367.5	to 82,763	other stops	Lunch/fuel up van	roundtrip: Yes <input type="radio"/> No <input checked="" type="radio"/>
(total miles)	(point of origin)	(destination)	(home depot, etc.)	(is this roundtrip mileage?)	
signed: <i>[Signature]</i>					
reviewed:		date to acc't:		by:	

## ALISO V ENGINEERING GROUP

## FIELD REPORT / SAMPLING DATA SHEET

2737 N Main Street, Suite 100  
Walnut Creek, CA 94597

Project No. 10-291-131004  
Address: 284 L Street, Crescent City

Date:

8/31/05

(925) 279-5000  
Fax (925) 279-5001

Name: FireBall  
Client: Colvin Oil

Purge Method:

(Dispersible)  
Bailer

Well ID	Color Water	Water Odor	Well Cap	Gal	time	temp	pH	Eh/ E.C.
MW-1	Clean	None	OK	1	1501	21.4	7.11	1.348
	Clean			3	1506	21.4	7.30	1.345
	Lt Brown/minimal 8.14	↓		4	1510	21.4	7.34	1.345
Well ID	Color Water	Water Odor	Well Cap	Gal	time	temp	pH	Eh/ E.C.
MW-2	Clean	None	OK	1	1522	19.4	7.53	1.13
	↓			3	1526	19.7	7.76	1.10
	Lt Brown/minimal 5.14	↓		4	1530	19.9	7.77	1.10
Well ID	Color Water	Water Odor	Well Cap	Gal	time	temp	pH	Eh/ E.C.
MW-3	Clean	None	replaced 2" plug + Lock	1	1547	17.1	7.33	1.563
	Lt Brown/minimal 8.14	↓		3	1552	17.0	7.42	1.565
				4	1557	17.0	7.45	1.565
Well ID	Color Water	Water Odor	Well Cap	Gal	time	temp	pH	Eh/ E.C.
MW-4	Clean	None	Installed new lock	0.1	1615	18.8	8.87	1.50
	↓			0.2	1621	18.4	8.82	1.53
				0.3	1626	18.4	8.82	1.56
Well ID	Color Water	Water Odor	Well Cap	Gal	time	temp	pH	Eh/ E.C.



## FIELD REPORT / SAMPLING DATA SHEET

Date: 8/3/05

Name: FireBall  
Client: Colvin Oil

Well ID	Well Diameter	DTW	Total Depth	Product Thickness	Time	Comments
MMW-1	2"	5.35	12.28	Ø	1420	3.14*0.006944*th or 0.16 gal/ft (2"). at 8 ft (3 purge= 3.9 gal) $12.28 - 5.35 = 6.93 \times 1.6 = 1.11$ $1.11 \times 3 = 3.33 \text{ gal}$
MMW-2	2"	5.24	12.30 <del>12.29</del>	Ø	1432	$12.30 - 5.24 = 7.06 \times 1.6 = 1.13 \times 3 = 3.39 \text{ gal}$
MMW-3	2"	5.45	12.41	Ø	1425	Replaced 2" plug + Lock $12.41 - 5.45 = 6.96 \times 1.6 = 1.11 \times 3 = 3.33 \text{ gal}$
MMW-4	3/4"	4.60	13.71	Ø	1437	3 purge at 8 ft = 0.2 gal $13.71 - 4.60 = 9.11$ / 1.5" hole lock

## FIELD CALIBRATION DATA

Time:

## **APPENDIX B**

### **LABORATORY REPORTS AND CHAIN OF CUSTODY RECORDS**

## argon laboratories

ALISTO ENGINEERING GROUP  
7604 SE MORRISON ST  
PORTLAND, OR 97215

REPORT DATE: 09/14/05  
SAMPLE DATE: 08/31/05

ATTN: BO BOWMAN  
CLIENT PROJ. ID: 10-291-13-04  
FIREBALL

AL JOB #: F09121

### Project Summary:

On September 7, 2005, this laboratory received 4 water samples.

Samples were analyzed according to instructions in accompanying chain-of-custody. Results of analysis are summarized on the following pages. Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Sample Control at (209) 581-9280.

  
for  
Hiram Cueto  
Lab Director

## Argon Laboratories Sample Receipt Checklist

Client Name: Alisto Engineering Group Date & Time Received: 9/7/05 10:00  
Project Name: Fireball Client Project Number: 10-291-13-04  
Received By: PH Matrix: Water ☒ Soil ☐ Other ☐  
Sample Carrier: Client ☐ Laboratory ☐ Fed Ex ☒ UPS ☐ Other ☐  
Argon Labs Project Number: F09121

Shipper Container in good condition? N/A ☐ Yes ☒ No ☐  
Sufficient sample volume for requested tests? Yes ☒ No ☐  
Samples received under refrigeration? Yes ☒ No ☐  
Samples received within holding time? Yes ☒ No ☐  
Chain of custody present? Yes ☒ No ☐  
Do samples contain proper preservative? N/A ☐ Yes ☒ No ☐  
Chain of Custody signed by all parties? Yes ☒ No ☐  
VOA vials with preservative? N/A ☐ Yes ☒ No ☐  
Chain of Custody matches all sample labels? Yes ☒ No ☐  
VOA vials preservative type: HCL ☒ Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> ☐ Other ☐  
Samples received in proper containers? Yes ☒ No ☐  
Do VOA vials contain zero headspace? N/A ☐ Yes ☒ No ☐  
Samples received intact? Yes ☒ No ☐

ANY "No" RESPONSE MUST BE DETAILED IN THE COMMENTS SECTION BELOW

Date Client Contacted: \_\_\_\_\_ Person Contacted: \_\_\_\_\_

Contacted By: \_\_\_\_\_ Subject: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Action Taken: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### ADDITIONAL TEST(S) REQUEST / OTHER

Contacted By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Call Received By: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



[illegible]



# argon laboratories

Alisto Engineering Group  
7604 SE Morrison St.  
Portland, OR. 97215

TPH-g / BTX&E / OXYGENATES

Date Sampled: 08/31/05

Date Received: 09/07/05

Method: 8015M / 8021B / 8260B

Proj. ID: 10-291-13-04

Site: Fireball

Matrix: Water

Lab ID:	F09121	F09122	F09123	F09124
Sample ID:	MW-1	MW-2	MW-3	MW-4
Units:	ug/L	ug/L	ug/L	ug/L

## Method 8015M / 8021B

Date Analyzed: 09/07/05

Total Petroleum Hydrocarbons @ Gasoline	<50	170 *	<50	<50
Benzene	<0.5	<0.5	<0.5	<0.5
Toluene	<0.5	<0.5	<0.5	<0.5
Xylenes	<1.0	<1.0	<1.0	<1.0
Ethyl Benzene	<0.5	<0.5	<0.5	<0.5
Methyl tert-Butyl Ether	<5.0	550	<5.0	81
Surrogate Spike Recovery:	106%	108%	110%	98%

## Method 8260B

Date Analyzed: 09/13/05

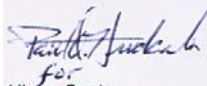
Methyl-t-Butyl Ether (MTBE)	N/A	590	N/A	100
Surrogate Spike Recovery:	N/A	97%	N/A	99%

Note(s):

(\*): Gas is primarily composed of MTBE.

Water samples are reported in ug/L; soil/sludge samples in mg/Kg; product/oil/non-aqueous liquid samples in mg/L.

ND means not detected at or above the stated reporting limit; N/A means analyte not applicable to this analysis.

  
for

Hiram Cueto

Lab Director

DHS Certification No. 2359



Alisto Engineering Group  
7604 SE Morrison St.  
Portland, OR. 97215

**Blank / QC Data**  
Method: 8015M / 8021B / 8260B

Proj. ID: 10-291-13-04  
Site: Fireball

Matrix: Water

		Method Rep. Lim.	
Sample ID:	Blank	Water	Soil
Units:	ug/L	ug/L	mg/Kg
Method 8015M / 8021B		Date Analyzed: 09/07/05	
Total Petroleum Hydrocarbons			
@ Gasoline	<50	50	1.0
Benzene	<0.5	0.5	0.005
Toluene	<0.5	0.5	0.005
Xylenes	<1.0	1.0	0.010
Ethyl Benzene	<0.5	0.5	0.005
Methyl tert-Butyl Ether	<5.0	5.0	0.050
Surrogate Spike Recovery:	102%		

<b>Method 8260B</b>		Date Analyzed: 09/13/05	
Methyl-t-Butyl Ether (MTBE)	<0.5	0.5	0.005
Surrogate Spike Recovery:	97%		

**Matrix Spike Recovery Summary**

Method	Lab ID	Client ID	Analyte	% Recovery MS / MSD	RPD
8015M	F09115	MW-6	Gas	82 / 93	13
8260B	F09117	MW-8	ETBE	109 / 103	6

**Laboratory Control Spike Recovery Summary**

Method	LCSID ID	Analyte	Percent Recovery
8021B	LCS0907F	Benzene	99
8260B	LCS0913F	MTBE	111

**Note(s):**

Water samples are reported in ug/L; soil/sludge samples in mg/Kg; product/oil/non-aqueous liquid samples in mg/L.

ND means not detected at or above the stated reporting limit; N/A means analyte not applicable to this analysis.

2905 Railroad Avenue, Ceres, CA 95307 • Phone (209) 581-9280 • Fax (209) 581-9282  
email: [info@argonlabs.com](mailto:info@argonlabs.com)